Kemper County Storage Complex

Proposed Injection Well 19-2

Mississippi Power Company

Emergency and Remedial Response Plan

40 CFR 146.94 (a)

Facility Information

Facility Name: Kemper County Storage Complex
Well Name: MPC 19-2

Facility Contact: Mississippi Power Company
Environmental Affairs
P.O. Box 4079
Gulfport, MS 39502-4079

Well Location: Kemper County, Mississippi
Latitude: 32.6130560
Longitude: -88.8061110

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List of Acronyms/Abbreviations

AoR	Area of Review
CCUS	Carbon capture, utilization, and storage
CO_2	Carbon dioxide
CMG	Computer Modelling Group
DOE	Department of Energy
ECO_2S	Establishing An Early Carbon Dioxide Storage
EPA	Environmental Protection Agency
ERRP	Emergency and Remedial Response
ft	feet
mg/L	milligrams per liter
MMt	Millions of Metric tons
MPC	Mississippi Power Company
PCC	Porters Creek Clay
PISC	Post-Injection Site Care
psi	Pounds per square inch
RCA	Routine Core Analysis
SS	Sub- Sea
TMS	Tuscaloosa Marine Shale
TVD	True Vertical Depth
UIC	Underground Injection Control
USDW	Underground Source of Drinking Water

A. Introduction

The purpose of this plan is to meet the requirements of 40 CFR 146.94 under the UIC Class VI Permit Guidelines. This Emergency and Remedial Response Plan (ERRP) outlines the actions that Mississippi Power Company (MPC) will take in order to address the unexpected movement of injection fluid or formation fluid in such a way as to endanger an underground source of drinking water (USDW) during Class VI activities, including the post-injection site care (PISC) period, for the proposed MPC 19-2 injection well.

The following actions must be taken by MPC if, through monitoring activities, evidence of the injection CO_2 stream or associated pressure front may pose a risk to a USDW:

1. Initiate the emergency shutdown plan for the injection well.
2. Take all steps reasonably necessary to identify and characterize the suspected release.
3. Notify the UIC Program Director as well as the MPC site representative of the emergency within 24 hours.
4. Implement the applicable portions of the approved ERRP.

Where the phrase “initiate shutdown plan” is used, the following protocol will be employed: MPC will immediately cease injection. However, in some circumstances, MPC will, in consultation with the UIC Program Director, determine whether gradual cessation of injection (using the parameters set forth in Attachment A of the Class VI permit) is appropriate.

B. Local Resources and Infrastructure

The Area of Review (AoR) as described in the *AoR and Corrective Action Plan* is a 16.50 mi^2 area, as illustrated in **Figure 1** below. Overall, the land surface is sparsely populated and rural. State websites and publically available satellite imagery has been utilized to determine infrastructure within the AoR that could potentially be impacted by CO_2 storage operations in the unlikely event of a containment loss in the storage interval.

Resources in the vicinity of the Kemper County Storage Complex that may be affected as a result of an emergency event at the project site include:

- **Middle and Lower Wilcox (Eocene-aged**) – shallowest USDW source,
- **Eutaw-McShan Formation (Upper Cretaceous)**, including the Eutaw-McShan, which representings the lowermost potential USDW with TDS reported ~3,000 – 10,000 ppm,
- **Upper Tuscaloosa Sand** – the zone directly above the main confining zone/seal (Tuscaloosa Marine Shale).

Infrastructure in the vicinity of the the Kemper County Storage Complex that that may be affected as a result of an emergency at the project site include:

- **Residences** – approximately fifty-nine (59) known residences
- **Businesses** – two (2) known businesses
- **Bodies of water** – six (6) bodies of water, which are all small ponds

There resources are illustrated on **Figure 1** with the Kemper County Storage Complex AoR defined for reference.

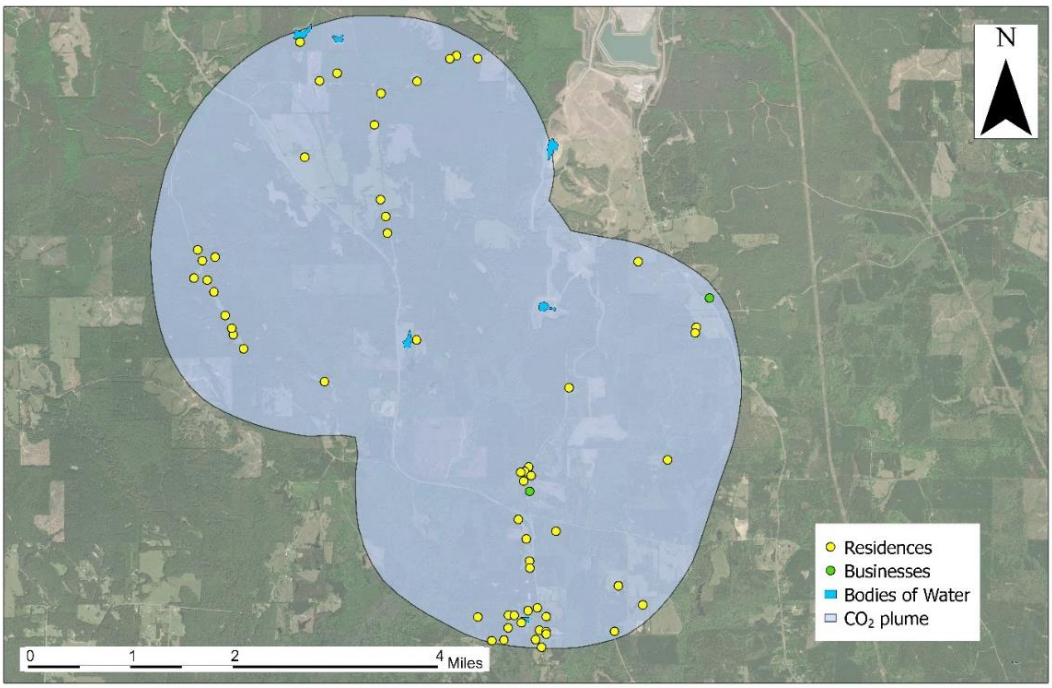

Figure 1. Map of the Site Resources and Infrastructure.

C. Potential Risk Scenarios

The following events related to the Kemper County Storage Complex that could potentially result in an emergency response:

- Injection or monitoring well integrity failure;
- Injection well monitoring equipment failure (e.g., shut-off valve or pressure gauge, etc.);
- A natural disaster (e.g., earthquake, tornado, lightning strike);
- Fluid (e.g. brine) leakage to a USDW;
- CO_2 leakage to USDW or land surface; or
- Induced seismic event.

Response actions will depend on the severity of the event(s) triggering an emergency response. “Emergency events” are categorized as shown in **Table 1**.

Table 1. Degrees of Risk for Emergency Events.

Emergency Condition	Definition
Major emergency	Event poses immediate substantial risk to human health, resources, or infrastructure. Emergency actions involving local authorities (evacuation or isolation of areas) should be initiated.
Serious emergency	Event poses potential serious (or significant) near term risk to human health, resources, or infrastructure if conditions worsen or no response actions taken.
Minor emergency	Event poses no immediate risk to human health, resources, or infrastructure.

D. Emergency Identification and Response Actions

Steps to identify and characterize the event will be dependent on the specific issue identified, and the severity of the event. The potential risk scenarios identified in Part 2 are detailed below.

In the event of an emergency requiring outside assistance, the lead project contact will call the MPC Security Team at (228) 865-5379 and MPC Communications Team at (228) 861-5543. Following communication with these teams, communication should continue in the order described below in **Table 2**.

Table 2. Other Project Personel to Contact

Contact	Company	Phone #
1. Project Engineers	MPC	(601) 743-1105 (601) 409-0833 (662) 361-1310
2. Plant O&M Manager	MPC	(601) 743-1560 (601) 409-0815
3. Plant Compliance & Support Manager	MPC	(334) 289-6108 (251) 238-1921
4. Plant Manager	MPC	(601) 743-1420 (601) 481-4013

E. Well Integrity Failure

Integrity loss of the injection well and/or verification well may endanger USDWs. There are no legacy wells that exist within the AoR, requiring no corrective action. All wells that penetrate the confinement interval will be completed to Class VI standards. A loss of mechanical integrity is unlikely, however, it represents the most likely leakage scenario for migration of injectate or formation fluids. Signs that integrity loss may have occurred are as follows:

- Automatic shutdown devices are activated:
  - Wellhead pressure exceeds the specified shutdown pressure.
  - Annulus pressure indicates a loss of external or internal well containment.
  - Pursuant to 40 CFR 146.91(c)(3), MPC will notify the UIC Program Director within 24 hours of any triggering of a shut-off system (i.e., down-hole or at the service).
- Mechanical integrity test results identify a loss of mechanical integrity.
- Sudden change in reservoir pressure measured in monitoring wells is outside of normal operating range.

Response actions:

- Cease injection and immediately the UIC Program Director notify the MPC site supervisor or designee.
- Notify the UIC Program Director within 24 hours of the emergency event, pursuant to 40 CFR 146.91(c).
- Project safety personnel will determine the severity of the event, based on the information available, within 24 hours of notification. As appropriate, follow the procedures described for a major/serious emergency or a minor emergency.
- For a Major or Serious emergency:
  - Initiate injection well shutdown plan.
  - Shut in well by closing flow valve, if not already closed via automatic shutdown devices.
  - Vent CO_2 from surface facilities.
  - Limit wellhead access to authorized safety personnel only.
  - Reset automatic shutdown devices.
  - Communicate with MPC Security Team, Communication Team, and personnel listed in Error! Reference source not found. and local authorities to initiate evacuation procedures.
  - Monitor well pressure, temperature, and annulus pressure to verify integrity loss and determine the cause and extent of failure. Notify and consult with the UIC Program Director to identify and implement the appropriate remedial actions to repair damage to the well.
- For a Minor emergency:
  - Conduct assessment to determine whether there has been a loss of mechanical integrity.
  - If there has been a loss of mechanical integrity, inititate shutdown plan.
  - Shut in well (close flow valve).
  - Vent CO_2 from surface facilities.
  - Reset automatic shutdown devices.
  - Monitor well pressure, temperature, and annulus pressure to verify integrity loss and determine the cause and extent of failure.
  - Identify and, if necessary, implement appropriate remedial actions (in consultation with the UIC Program Director).

F. Injection Well Monitoring Equipment Failure

The failure of monitoring equipment for wellhead pressure, temperature, and/or annulus pressure is typically classified as a minor emergency, but may indicate a problem with the injection well that could endanger USDWs. This situation arises when it is determined that failure of equipment is due to changing system conditions (e.g. elevated pressure or temperature above designed gauge specificationns).

Response actions:

- For a Major or Serious emergency:
  - Immediately cease injection and notify the MPC site supervisor or designee.
  - Initiate shutdown plan.
  - Shut in well by closing flow valve.
  - Vent CO_2 from surface facilities.
  - Limited access to wellhead to authorized safety personnel only.
  - Communicate with MPC personnel and local authorities to initiate evacuation procedures.
  - Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
  - Project safety personnel will determine the severity of the event, based on the information available, within 24 hours of notification.
  - Monitor well pressure, temperature, and annulus pressure to verify integrity loss and determine the cause and extent of failure and implement appropriate remedial actions to repair damage to the well monitoring equipment (in consultation with the UIC Program Director).
- For a Minor emergency:
  - Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
  - Project safety personnel will determine the severity of the event, based on the information available, within 24 hours of notification.

– Monitor well pressure, temperature, and annulus pressure to determine the cause and extent of failure; identify and, if necessary, implement appropriate remedial actions to repair or replace the injection well monitoring equipment (in consultation with the UIC Program Director).

G. Potential Brine or CO_2 Leakage to USDW

This type of emergency is indicated by elevated concentrations of indicator parameter(s) in groundwater sample(s) or other evidence of fluid (brine) or CO_2 leakage into a USDW. This type of emergency is always classified as a serious or major emergency.

Response actions:

- Immediately cease injection and notify the MPC site supervisor or designee.
- Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
- Project safety personnel will determine the severity of the event, based on the information available, within 24 hours of notification.
- For all emergencies (Major, Serious, or Minor):
  - Initiate shutdown plan.
  - Shut in well (close flow valve).
  - Vent CO2 from surface facilities.
  - Collect a confirmation sample(s) of groundwater and analyze for indicator parameters. (Potential indictors are listed in Tables 5 and 8 of the Testing and Monitoring Plan.).
  - Upon approval from the UIC Program Director, begin injecting brine into the above-zone monitoring wells to establish a pressure buffer between the confinement interval and the USDWs.
  - If the presence of indicator parameters are confirmed, develop (in consultation with the UIC Program Director) a case-specific work plan to:
    - ✓ Install additional groundwater monitoring points near the affected groundwater well(s) to delineate the extent of impact; and
    - ✓ Remediate unacceptable impacts to the affected USDW.

- Arrange for an alternate potable water supply, if the USDW was being utilized and has been caused to exceed drinking water standards.
- Proceed with efforts to remediate USDW to mitigate any unsafe conditions (e.g., install system to intercept/extract brine or CO_2 or "pump and treat" to aerate CO_2-laden water).
- Continue groundwater remediation and monitoring on a frequent basis (frequency to be determined by MPC and the UIC Program Director) until unacceptable adverse USDW impact has been fully addressed.

H. Natural Disaster

Well problems (integrity loss, leakage, or malfunction) may arise as a result of a natural disaster affecting the normal operation of the injection well. An earthquake may disturb surface and/or subsurface facilities; and weather-related disasters (e.g., tornado or lightning strike) may affect surface facilities.

If a natural disaster occurs that affects normal operation of the injection well, perform the following:

Response actions:

- Immediately cease injection and notify the MPC site supervisor or designee.
- Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
- Project safety personnel will determine the severity of the event, based on the information available, within 24 hours of notification.
- For a Major or Serious emergency:
  - Initiate shutdown plan.
  - Shut in well (close flow valve).
  - Communicate with MPC personnel and local authorities to initiate evacuation plans, as necessary.
  - Vent CO_2 from surface facilities.
  - Limit access to wellhead to authorized personnel only.

  - Monitor well pressure, temperature, and annulus pressure to verify well integrity and determine the cause and extent of any failure.
  - If loss of mechanical integrity is detected, implement approporaite remedial action (in consultation with the UIC Program Director).
  - Determine if any leaks to ground water or surface water occurred.
  - If contamination or endangerment is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- For a Minor emergency:
  - Conduct assessment to determine whether there has been a loss of mechanical integrity.
  - If there has been a loss of mechanical integrity, initiate shutdown plan.
  - Shut in well (close flow valve).
  - Vent CO_2 from surface facilities.
  - Reset automatic shutdown devices.
  - Monitor well pressure, temperature, and annulus pressure to verify integrity loss and determine the cause and extent of failure; identify and, if necessary, implement appropriate remedial actions (in consultation with the UIC Program Director).
  - Identify and, if necessary, implement appropriate remedial actions (in consultation with the UIC Program Director).
  - Ensure that only authorized personnel have access to wellhead

I. Response Personnel and Equipment

Site personnel, project personnel, and local authorities will be relied upon to implement this ERRP. The City of Collinsville is the closest population center to the proposed MPC19-2 injection well; however, adjacent areas to the east, and north span the communities of Bailey and De Kalb, respectively. Therefore, both city and county emergency responders (as well as state agencies) may need to be notified in the event of an emergency. Please refer to Table 3 for emergency points of contact.

Table 3. Contact information for key local, state, and other authorities.

Agency	Phone Number
Kemper County Sheriff Office	(601) 743-4880
Jackson Police Department (State of Mississippi)	(601) 960-1217
Mississippi Emergency Management Agency	(601) 933-6362
Universal Environmental Services	(601) 693-1104
UIC Program Director (EPA Region IV)	(228) 679-5915
EPA National Response Center (24 hours)	(800) 424-8802
Mississippi Geological Survey	(601) 961-5500
US EPA National Response Center (24 hr)	(800) 424-8802

A site-specific emergency contact list will be developed and maintained during the life of the project. MPC will provide the current site-specific emergency contact list to the UIC Program Director.

Equipment needed in the event of an emergency and remedial response will vary depending on the triggering emergency event. Response actions (cessation of injection, well shut-in, and evacuation) will generally not require specialized equipment to implement. Where specialized equipment (such as a drilling rig or logging equipment) is required, MPC shall be responsible for its procurement.

J. Emergency Communications Plan

In the event of an emergency requiring outside assistance, the project contact lead shall call the MPC Security Dispatch at (228) 865-5379 and MPC Corporate Communications at (228) 861-5543.

MPC will communicate to the public about any event that requires an emergency response to ensure that the public understands what happened and whether or not there are any environmental or safety implications. The amount of information, timing, and communications method(s) will be appropriate to the event, its severity, whether any impacts to drinking water or other environmental resources occurred, any impacts to the surrounding community, and their awareness of the event.

MPC will describe what happened, any impacts to the environment or other local resources, how the event was investigated, what responses were taken, and the status of the response. For responses that occur over the long-term (e.g., ongoing cleanups), MPC will provide periodic updates on the progress of the response action(s).

MPC will also communicate with entities who may need to be informed about or take action in response to the event, including local water systems, CO_2 source(s) and pipeline operators, land owners, and Regional Response Teams (as part of the National Response Team).

K. Plan Review

This ERR Plan shall be reviewed:

- At least once every five (5) years following its approval by the permitting agency;
- Within one (1) year of an area of review (AOR) reevaluation;
- Within the timeframe indicated by the UIC Program Director following any significant changes to the injection process or the injection facility, or an emergency event; or
- As required by the permitting agency.

If the review indicates that no amendments to the ERRP are necessary, MPC will provide the permitting agency with the documentation supporting the “no amendment necessary” determination.

If the review indicates that amendments to the ERRP are necessary, amendments shall be made and submitted to the permitting agency within 1 year following an event that initiates the ERRP review procedure.

L. Staff Training and Exercise Procedures

MPC will integrate the ERRP into the existing power plant-specific standard operating procedures and training protocols. Periodic training will be provided, not less than annually, to well operators, plant safety and environmental personnel, the plant

manager, plant superintendent, and corporate communications. The training plan will document that the above listed personnel have been trained and possess the required skills to perform their relevant emergency response activities described in the ERRP.

M. Communications with Adjacent Landowners and Emergency Response Personnel

Prior to the start of CO_2 injection operations, MPC will attempt to promptly communicate with landowners living adjacent to the storage complex to provide information of the nature of the operations, potential risks, and appropriate response approaches under various emergency scenarios. MPC's point of contact for any landowner or stakeholder concerns are identified and listed in Figure 2 and Table 4 shown below.

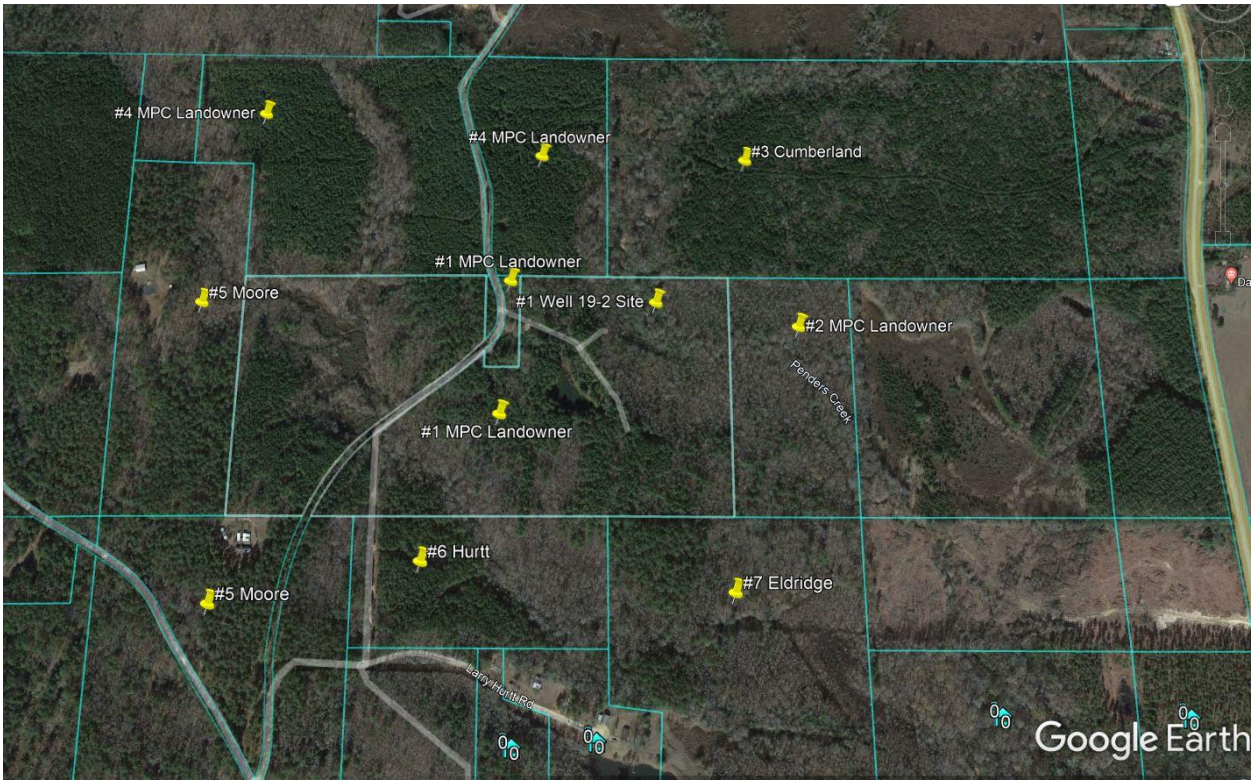

Figure 2. Aerial map provided by MPC identifying the land parcels and ownership around the proposed MPC 19-2 injection well. Land owner details are provided in Table 4.

Table 4. Details of the landowners identified by MPC shown in Figure 2.

Kemper County				
Tract Number	**Parcel ID**	**S – T – R**	**Owner Name**	**Address**
1	167-19-02.000 167-19-02.002	19-9N-15E	Mississippi Power Company (Includes Well 19-2)	
2	167-19-02.001	19-9N-15E	Mississippi Power Company	
3	167-19-04.000	19-9N-15E	Jimmy and Jane Cumberland	11970 Road 759 Philadelphia, MS 39350
4	167-19-11.000	19-9N-15E	Mississippi Power Company	
5	183-30-13.000 167-19-01.000	30-9N-15E 19-9N-15E	Jesse M. Moore, et ux.	107 Larry Hurtt Road Bailey, MS 39320
6	183-30-12.000	30-9N-15E	Joyce G. Hurtt (LE)	431 Larry Hurtt Road Bailey, MS 39320
7	167-19-03.000	19-9N-15E	Michael Todd Eldridge	12097 Kelly Lane Collinsville, MS 39325